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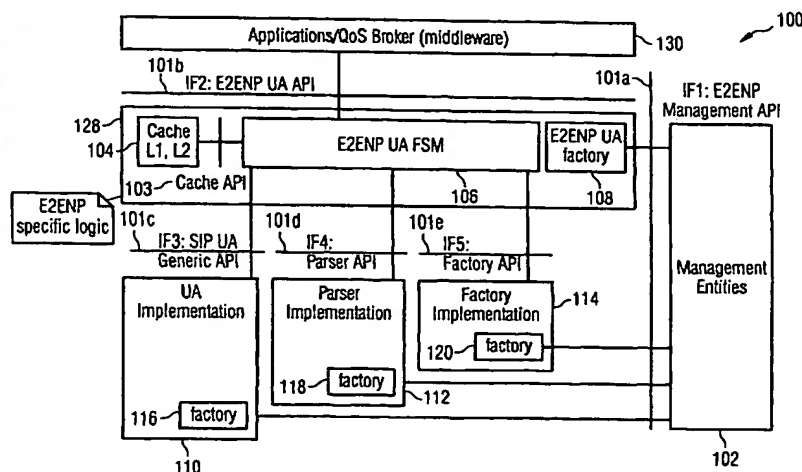
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SOFTWARE ARCHITECTURE FOR CAPABILITY AND QUALITY-OF-SERVICE NEGOTIATIONS AND SESSION ESTABLISHMENT FOR DISTRIBUTED MULTIMEDIA APPLICATIONS



(57) Abstract: The underlying invention generally relates to the field of mobile computing in a wireless mobile networking environment with distributed multimedia applications (130). More specifically, it is directed to the field of Quality-of-Service (QoS) management for adaptive real-time services running on mobile devices and an End-to-End Negotiation Protocol (E2ENP) based on a novel usage of a session-layer protocol (SIP) in conjunction with extensions of a session description protocol implementation (SDP, SDPng) and the Extensible Markup Language (XML) for defining user profile and terminal capability information which allow to enforce and use hierarchical QoS Contract specifications. Thereby,

said End-to-End Negotiation Protocol (E2ENP) is applied to derive negotiable information, which enables a prenegotiation, fast negotiation and a fast, dynamic re-negotiation of the end-to-end quality and capabilities for a telecommunication session, for multiple configurations of two or a multiplicity of end peers and/or middleware in a consistent, reliable, and incremental way by enabling the mobile applications to efficiently and timely react to QoS violations. Furthermore, the invention pertains to the concept and realization of a novel E2ENP User Agent (128) which encapsulates the signaling part of E2ENP and expresses the information to be negotiated in an interchangeable format in such a way that heterogeneous applications (130) can easily agree on a reference model applied to orchestrate local, peer, and network resources according to the preferences and profiles of the respective user in a coordinated manner. According to one embodiment of the invention, the employed E2ENP sessionlayer protocol Application Programming Interfaces (101a-e) are independent of the actually used session-layer protocol and session description protocol implementations.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/11439

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX, IBM-TDB

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| X          | <p>MANDATO D: "Deliverable 1.2 - Concepts for Service adaption, scalability and QoS handling on mobility enabled networks"</p> <p>IST-1999-10050 BRAIN, XX, XX,<br/>31 March 2001 (2001-03-31), pages 1-229,<br/>XP002205057</p> <p>cited in the application</p> <p>page 3</p> <p>page 60, paragraph 2.4.7.2.6 - page 61</p> <p>page 78, paragraph 2.6.1</p> <p>page 79, paragraph 2.6.3 - page 80</p> <p>page 81, paragraph 2.6.4.1</p> <p>page 89, paragraph 2.6.8 - page 90</p> <p>page 94, paragraph 3.1 - page 96</p> <p>page 99, paragraph 3.3.3 - page 100</p> <p>page 101, paragraph 3.4.2 - page 102</p> <p>page 114, paragraph 3.4.4</p> <p>page 119, paragraph 3.5 - page 125</p> <p>-----</p> <p>-/--</p> | 1-20, 24, 25          |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

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\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

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Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP 03/11439

| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT |   |                       |
|--|---|-----------------------|
| Category *   | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
| X  | <p>MANDATO D: "Presentation: Concepts of Service Adaption, Scalability, and QoS Handling on Mobility enabled Networks" IST MOBILE COMMUNICATION SUMMIT, XX, XX, 10 September 2001 (2001-09-10), pages 1-16, XP002205058<br/>page 3<br/>page 5 - page 11</p> | 1-20,24, 25           |
| A  | <p>EP 1 248 431 A (SIEMENS AG ;SONY INTERNAT EUROP GMBH (DE))<br/>9 October 2002 (2002-10-09)<br/>cited in the application<br/>abstract<br/>page 16, line 53 - page 18, line 48<br/>page 19, line 19 - line 20</p>  | 1-25                  |

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 03/11439

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-20, 24, 25

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-20,24,25

A system offering an Application Programming Interface, A  
system for establishing a session, and a negotiation method.  
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2. claims: 21-23

A contention resolution method.  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No  
PCT/EP 03/11439

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) |             | Publication<br>date |
|---|---|---------------------|----------------------------|-------------|---------------------|
| EP 1248431                                | A | 09-10-2002          | EP                         | 1248431 A1  | 09-10-2002          |
|   |   |                     | WO                         | 02078289 A1 | 03-10-2002          |
| -----                                     |   |                     |                            |             |                     |